

What is claimed is:

1. A directable apparatus for downhole directional drilling comprising:
a mandrel housing having a mandrel disposed within the mandrel housing, a
biasing member for retracting the mandrel, and a collar coupling the mandrel with the
mandrel housing to control pressure actuated extension of the mandrel between a first
5 extended position and a second extended position; and
a directable housing pivotally coupled to the mandrel housing, the directable
housing having an articulating member pivotally secured therein, wherein the articulating
member has a passage therethrough with a first portion for receiving the mandrel in the
first extended position to lock the directable housing at a first angle relative to the
10 mandrel housing and a second portion for receiving the mandrel in the second extended
position to lock the directable housing at a second angle relative to the mandrel housing.
2. The directable apparatus of claim 1, wherein the first angle relative to the mandrel
housing is zero, resulting in axial alignment.
3. The directable apparatus of claim 1, further comprising a transmission shaft
extending through the mandrel and the articulating member.
4. The directable apparatus of claim 3, wherein the transmission shaft provides
torque transfer between a mud motor and a drill bit.
5. The directable apparatus of claim 1, wherein the articulating member pivots about
an axis generally perpendicular with an axis of the mandrel.
6. The directable apparatus of claim 1, wherein the articulating member has a range
of pivoting that is constrained by contact between the articulating member and the
directable housing.

7. The apparatus of claim 1, wherein the collar is a J-slot collar having an outwardly facing slot slidably receiving a finger element therein, and a cylindrical body having one or more collar shoulders extending in the second axial direction for selective engagement with the one or more housing shoulders, wherein the outwardly facing slot is adapted to
5 cause rotation of the collar upon reciprocating the collar in both the first and second axial directions, wherein the slot defines a repeating cycle that provides alignment of the one or more collar shoulders with the one or more housing shoulders upon a first fluid pressure actuation to prevent actuating the mandrel into engagement with the articulating member and misalignment of the one or more collar shoulders with the one or more
10 housing shoulders upon a second fluid pressure actuation to actuate the mandrel into engagement with the articulating member and deploy the downhole adjustable bent housing.

8. The directable apparatus of claim 1, wherein the articulating member is pivotally secured within the housing by a pair of pivot pins.

9. The directable apparatus of claim 2, wherein the second angle is less than about 2 degrees from axial alignment.

10. An apparatus for use in directional drilling of wells comprising:
an elongate housing having a proximal section, a distal section, and a pivot joint connecting the proximal and distal sections;

an actuation shaft extending between the proximal section and the distal section
5 through the pivot joint, the actuation shaft being selectively extendable between a first position and a second position;

an articulating member pivotally secured inside the distal section to define a pivot axis, the articulating member comprising an intersecting bore having an axial centerline that is perpendicular to and offset from the pivot axis, and a landing port adapted for
10 receiving the distal end of the actuation shaft;

wherein extending the actuation shaft into contact with the landing port secures the distal section in axial alignment with the proximal section; and

15 wherein extending the actuation shaft into axial alignment with the intersecting bore secures the distal section to the proximal section at an angle apart from axial alignment.

11. The apparatus of claim 10 wherein the actuation shaft is a tubular member with a rotating transmission shaft disposed therein.

12. The apparatus of claim 10 wherein the actuation shaft is displaced using drilling mud pressure.

13. The apparatus of claim 10, further comprising a means biasing the actuation shaft in the proximal direction.

14. The apparatus of claim 10, further comprising a locking member for securing the distal section in axial alignment with the proximal section.

15. The apparatus of claim 10, further comprising a rotating transmission shaft extending through the elongate housing generally along the axial centerlines of the proximal and distal sections of the elongate housing.

16. The apparatus of claim 15, wherein the transmission shaft comprises a proximal section and a distal section, the proximal section joined to the distal section at a universal joint.

17. A downhole adjustable bent housing for use in drilling operations, comprising:
a first housing section;
a second housing section;
a connector connecting said first housing section to said second housing section and permitting said second housing section to pivot relative to said first housing section;

a mandrel extending between said first housing section and said second housing section through said connector and moveable between a retracted position and an extended position;

an articulating member pivotally secured within said second housing section, said articulating member having a deviated passage therethrough for receiving said mandrel and being pivotal between a first, inactive position when the mandrel is in its retracted position and a second, deployed position when the mandrel is in its extended position, the deployed mandrel position inducing said second housing to pivot relative to said first housing.

006740-13981950